

## REMARKS/ARGUMENTS

### Telephone interview

Applicant's undersigned attorney thanks the Examiner for the courtesy of a brief telephone interview on June 28, 2010. In the interview, the references were discussed in only a cursory manner, and the Examiner suggested that if the applicant is willing to amend the claims for purposes of avoiding an appeal, applicant should file an amendment and a request for continued examination, making changes which the applicant believes would place the application in condition for allowance. No agreement as to allowable claims was reached.

### Specification

The specification has been amended to correct an obvious typographic error.

### Claim Rejection - 35 USC § 112

Claims 1-18, 49, and 50 have been rejected under 35 U.S.C. 112, second paragraph as indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Examiner has objected to the language "the outer portion covering from 70% to 100% of the surface of the inner portion" as "confusing" because the specification teaches that "optimal double helix wrap coverage is between 70% and 100%," and claims 1 and 49 do not "teach" a double helix. Applicant does not understand how this language is confusing, strongly disagrees about the purpose of the claim being to "teach" anything, and believes strongly that the claim language is supported by disclosure. However, claim 1 has been amended to remove the 70% to 100% limitation, and claim 49 has been amended (without prejudice to applicant's right to reassert the original claim in a

continuing application) to recite the double helix. The claims are therefore believed to overcome the Examiner's rejection, whatever its basis.

Claim Rejections - 35 USC § 102

Claims 1, 4, 14, 15, and 42 have been rejected as anticipated by Guevel et al, U.S. Patent 4,840,021 (Guevel).

As now written, these claims clearly distinguish over Guevel.

Guevel relates to a sewing thread which is strengthened by simultaneously spinning core filaments 3, cover filaments 4, and wrapping filaments 5 into a thread at drawing rollers 11. The wrapping filaments 5 comprise a small proportion of the total thread, and "the main function of wrapping yarn 5 is to lock the staple fibers of cover 4 to cancel their corrosion during passage in the eye of the sewing needle." (Col. 3, lines 19-22.)

Although Guevel asserts that "[b]oth the filament part and the stretch broken or cut fibers can be made from any known textile material, whether natural fibers, artificial fibers or synthetic fibers," the disclosure is directed to a substitute for known threads, and nothing but standard thread fibers is suggested, the sole example using Trevira T712 and Trevira T132 polyesters. Claim 1 has been amended to call for a "yarn suitable for weaving into fabric," the yarn comprising "an inner portion of spun staple fibers of post consumer recycled (PCR) polyethylene terephthalate (PET) formed from a pre-extruded liquid polymer insufficiently pure to pass through a twenty micron opening without clogging it and an outer portion comprising a different material." Nothing in Guevel shows or suggests this combination. Although Pepin discloses the use of recycled PET bottles in a highly specialized continuous/discontinuous ("CD")

yarn (twisted) or tow (untwisted) precursor for use in fiber-reinforced composite, that PET is a continuous filament which is intended to melt as the composite is formed, and absent applicant's disclosure suggests nothing about forming a yarn suitable for weaving into a fabric.

Claim 42 has been amended to call for a method of producing a yarn comprising forming an intermediate yarn by feeding a first staple fiber into a spinning device to form a sheath of the first staple fiber over the core, and thereafter feeding the intermediate yarn into a cover wrapping machine or an air jet machine to form at least one helix of a continuous yarn around the intermediate yarn. Guevel does not disclose such a method. Rather, Guevel uses a single spinning frame with an additional feed device 8 for feeding a wrapping yarn 5 to drawing rollers 11 in a plane offset from the plane of the filaments 3 and 4.

Nothing in Guevel or Pepin, taken alone or in combination with Pepin, shows or suggests the construction called for in claim 1 or the method called for in claim 42.

#### Claim Rejections - 35 USC § 103

All the remaining claims (claims 5-13, 16-18, 20-41, and 43-50) have been rejected as obvious over Guevel in view of Pepin, U.S. Patent 5,487,941.

As previously indicated, Guevel is directed to a sewing thread having core filaments, cover filaments, and wrapping filaments. The thread is produced entirely on a spinning machine, adding an additional bobbin for the wrapping filaments. This produces a thread in which the core, cover and wrapping filaments all have the same "rate of torsion." As noted above, the main function of wrapping yarn 5 is to lock the staple fibers of cover 4.

Pepin is directed to a "continuous/discontinuous" ("CD") yarn (twisted) or tow (untwisted) precursor composite for use in fiber-reinforced composite structures molded under heat and pressure. The CD yarn comprises intermixed discontinuous high-temperature structural filaments (like E-glass) with continuous thermoplastic filaments. "Upon molding, the intermixing of continuous thermoplastic filaments with the discontinuous structural reinforcing filaments allows the continuous/discontinuous filament (CD) yarn or tow to stretch along its length as the thermoplastic filaments melt." (Col. 2, lines 5-9.) In one embodiment (Figs. 11 and 12), a CD tow is held together by a "binder" consisting of a thread helically wrapped around the tow. Pepin discloses that the continuous thermoplastic filaments may be "polyethyleneterephthalate (PET) tows spun from recycled soft drink bottles by Hills R & D of Melbourne, Fla." (Col. 10, lines 40-41.)

Pepin is cited by the Examiner merely for the proposition that "using such recycled fibers, inherently possessing such an inability of passing [through a twenty micron opening without clogging], from beverage bottles in a yarn structure is well known."

Applicant notes that Pepin's use of the recycled PET to produce continuous filaments strongly suggests that the PET has been processed to remove impurities, even given the limited function of the PET filaments as discussed below, and Applicant therefore does not concede that the material inherently possesses the inability to pass through a twenty micron opening without clogging.

As discussed at length in the Background of the Invention part of the present specification, however, the broad concept of using recycled PET in a yarn is old.

Those skilled in the art have been trying for many years to incorporate such recycled material into a yarn in a commercially acceptable way. Before the present invention, none has succeeded. Applicant has discovered such a way, producing a yarn that overcomes the inherently poor hand, poor abrasion-resistance, and poor strength properties of the recycled fiber. This is a major breakthrough, and one that deserves patent protection. It is believed that claim 1 and the other pending claims particularly point out and distinctly claim the subject matter of the present invention in a way that clearly distinguishes over the art.

Absent applicant's disclosure, neither Guevel nor Pepin, taken alone or together, gives any suggestion of how the problems inherent in the use of recycled plastic could be solved. Guevel is not concerned with the problem at all. Pepin does not appear to care about any of these poor characteristics of recycled PET because he is making a highly specialized tow (or yarn) in which the continuous thermoplastic PET filaments merely need to hold the discontinuous structural filaments aligned as they slide into overlapping positions when the PET melts in the molding process. Nothing in Pepin or Guevel suggests that the continuous PET filaments of Pepin would have any use in the sewing thread of Guevel. Further, even if such a combination were made, it would not be the structure now called for in the claims.

Claims 5-13, 16-18, and new claim 51 are dependent on claim 1 and are believed to be allowable with it. These claims also add further features which, in the combination claimed, are not suggested by the art. Merely by way of example, claim 17 calls for the outer portion to comprise two helically wrapped cover yarns, wrapped in opposite directions, a construction impossible to achieve with Guevel's machine,

and new claim 51 adds that the outer portion covers from 70% to 100% of the surface of the inner portion. This construction is completely foreign to anything suggested by Guevel.

The Examiner's "grounds" of rejection of the remaining claims appear to be based on his personal knowledge of the art, and not on anything actually disclosed or suggested by the art of record. Applicant is limited in his refutation of these rejections by the fact that the Examiner has made no attempt to apply the art to the actual language of any of the claims.

Stated in a formal legal way, the Examiner has not established a *prima facie* case of obviousness. To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. MPEP 2143; *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1970). The references must be considered as a whole, and "[r]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR Int'l Co. v. Teleflex Inc.*, 550 US 550, 82

USPQ2d 1385, 1396 (2007), quoting with approval *In re Kahn*, 78 USPQ2d 1329, 1336, 441 F.3d 977, 988 (Fed. Cir. 2006).

There is nothing in either Guevel or Pepin to suggest combining the references; Guevel is concerned with making a sewing thread interchangeable with existing sewing threads, and Pepin is directed to a specialty yarn or tow to be melted into a composite fiberglass structure. Given the many years of failure of the art to develop an acceptable fabric yarn incorporating post-consumer recycled PET, there is certainly nothing in Guevel or Pepin that would suggest that combining them would lead to a reasonable expectation of success in solving a problem neither is concerned with. Further, combining the references would not lead to the structure called for in the claims.

Claim 20 as amended calls for, “A yarn comprising an inner portion of spun staple fibers of post consumer recycled (PCR) polyethylene terephthalate (PET) formed from a pre-extruded liquid polymer insufficiently pure to pass through a twenty micron opening without clogging it and an outer portion comprising an inner helix and an outer helix formed of a material different from the inner helix.” Nothing in the cited art shows or suggests anything like this structure, and the Examiner has made no rejection even purporting to apply the art. The unsupported assertion that “[t]he ordinarily skilled artisan would be more than capable of deciding which of the many well known structures to use, dependent on end use” is merely a conclusory statement without any factual underpinnings, lacking even a citation to a reference showing what the “many well known structures” might be.

Claim 21 calls for, "A yarn comprising two spun staple fibers of different material, the first staple fibers being longer than the second staple fibers, the second staple fibers forming a major part of the surface of the yarn." Nothing in the cited art shows or suggests anything like this structure. Again, a conclusory statement, without evidentiary underpinnings, does not create a *prima facie* case of obviousness.

Claim 22 calls for, "A yarn comprising a core formed of at least one strand of a continuous filament having a tenacity of at least about five grams per denier, a sheath of staple fibers surrounding the core, and a cover comprising an inner helix and an outer helix." Nothing in the cited art shows or suggests anything like this structure. Yet again, a conclusory statement, without evidentiary underpinnings, does not create a *prima facie* case of obviousness.

Claims 23-27 are dependent on claim 22 and are believed to be allowable with it. They add further features which, in the combination claimed, are not suggested by the art.

Claim 28 as amended calls for, "A method of forming a yarn containing staple fibers of PCR plastic formed from a pre-extruded liquid polymer insufficiently pure to pass through a twenty micron opening without clogging it, comprising spinning a plastic-surfaced yarn from the staple fibers of PCR plastic, and thereafter forming a cover over the plastic surfaced yarn with a cover wrapping machine or an air jet machine." Applicant's use of a spinning machine, followed by the use of a separate covering machine, in the manner set out, is believed to be both new and non-obvious. It is certainly not shown or suggested by the cited art. As discussed above, Guevel uses a single spinning machine to create a thread at rollers 11. The rejection does not



even purport to provide a rationale for the rejection of this claim, and certainly meets none of the three requirements for creating a *prima facie* case of obviousness.

New claim 52 is dependent on claim 28 and is believed to be allowable with it. It calls for the cover to be formed over the plastic surfaced yarn with a cover wrapping machine. Nothing in the prior art suggests such a method.

Claim 29 is directed to another embodiment of the invention. It calls for, "A yarn comprising a high strength fasciated yarn comprising two spun staple fibers of different materials, the first being synthetic and not moisture absorbent and longer than the second fibers, the second fibers forming a major part of the yarn surface." The cited art appears to be totally unrelated to the subject matter of this claim. The Examiner's blanket rejection of the claim, like his obviousness rejection of the other claims, appears to be completely a conclusory statement without any factual, evidentiary underpinnings.

Claim 30 calls for, "A method of producing a spun yarn comprising two layers of sheath over a continuous core, the method comprising simultaneously feeding two different staple fibers into a spinning device to simultaneously form the two layers over the core, one of the layers being predominantly one of the staple fibers, and the other layer being predominantly the other." Nothing in the cited art shows or suggests this method.

Claims 31-34 are dependent on claim 30 and are believed to be allowable with it. They also add features which, in the claimed combination, are unsuggested by the art of record.

Claim 35 calls for, "A method of producing a spun yarn comprising two layers of sheath over a continuous filament core, the method comprising forming an intermediate yarn by feeding a first staple fiber into a spinning device to form a sheath of the first staple fiber over the core, and thereafter feeding a second staple fiber into a spinning device to form a sheath of the second staple fiber over the intermediate yarn." Nothing in the cited art shows or suggests such a method, for the reasons previously enunciated.

Claims 36-39 are dependent on claim 35 and are believed to be allowable with it. They also add features which, in the claimed combination, are unsuggested by the art of record.

Claim 40 has been amended to include the subject matter of claim 41. As amended it calls for, "A corespun yarn comprising a core and two sheaths over the core, the first sheath being formed of spun staple fibers of different compositional makeup than the second sheath, the second sheath comprising a minor portion of the material of the first sheath in addition to at least one other material." Nothing in Guevel or Pepin has anything to do with the subject matter of this claim. Its rejection is purely on the basis of conclusory statements with no factual, evidentiary basis.

Claim 42 has been discussed above in relation to the rejection under 35 USC § 102. As discussed there, the claim defines a two-stage method which is totally foreign to Guerrel and Pepin. None of the three essential elements of a *prima facie* case has been made by the Examiner.

Claims 43 and 44 are dependent on claim 42 and are believed to be allowable with it, as well as adding new features which are believed to be non-obvious in the combination claimed.

Claim 45 calls for, "A continuous and multi-filament yarn having a total denier of 12-800 and comprising 10-90% by weight of continuous high tenacity and high modulus monofilaments having a tenacity higher than 15 and a modulus higher than 500, intermingled with continuous lower tenacity and lower modulus monofilaments having a tenacity between 5 and 15." This claim, directed to an embodiment of the core of the present invention, is neither shown nor suggested by the cited art. Other than a conclusory statement of obviousness, the Examiner has made no attempt to apply the art to the language of the claim.

Claims 46-48 are dependent on claim 45 and are believed to be allowable with it. They also add additional features which are believed to be new and non-obvious in the claimed combination.

Claim 49 has been amended to call for, "A yarn comprising an inner portion of spun staple fibers of post consumer recycled (PCR) polyethylene terephthalate (PET) formed from a pre-extruded liquid polymer insufficiently pure to pass through a twenty micron opening without clogging it and an outer portion comprising two helically wrapped cover yarns, wrapped in opposite directions, the outer portion covering from 70% to 100% of the surface of the inner portion." It is believed to be patentable for reasons similar to those discussed above with respect to claims 17 and 51.

Claim 50 is dependent on claim 49 and is believed to be patentable with it. It adds the continuous filament core, a feature which is believed to be new and non-obvious in the combination set out.

Claims 51 and 52 have been discussed above, with their parent claims.

It is respectfully requested that the case be passed to issue. Should the Examiner have questions or suggestions, he is urged to call applicant's undersigned attorney at 314-238-2400, extension 426.

The Commissioner is hereby authorized to charge any additional fees or credit overpayment under 37 CFR 1.16 and 1.17 which may be required by this paper to Deposit Account 162201.

Respectfully submitted,

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